TECHNOLOGY FOR

Alaskan Transportation

Winter 1994
Volume 19 Number 4
October - December 1994
Special Edition: Metric

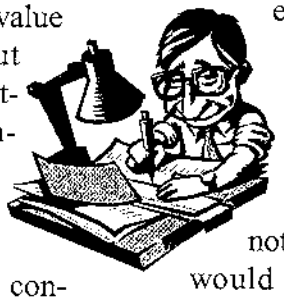
IN THIS ISSUE . . .

This newsletter is funded by a grant from the Federal Highway Administration and the Alaska Department of Transportation and Public Facilities.

Local Technical Assistance Program

Problem Profile: "Hard Conversion vs. Soft Conversion"

When implementing metrication, all DOTs must make decisions. One early decision is choosing the method of conversion—should the value be conveniently rounded (hard converted), or should the value be left as an exact, but sometimes awkward, metric equivalent (soft converted)? AASHTO's *Guide to Metric Conversion* recommends that "whenever possible, hard conversion should be used." The Texas Department of Transportation, however, has taken the stance that "soft conversions...will be used until new national standards are developed."



According to Rich Rogers, chair of TxDOT's Metric Working Task Force, his department opted for temporary soft conversions for the benefit of the entire metric movement. Rogers, who works for TxDOT's metric coordinator, Bobbie Templeton, contends that adopting hard conversions not endorsed at a national level would cause the DOTs to "go around in circles."

He adds that before they are implemented, hard conversions must also be coordinated with industry

(continued on page 3)

AASHTO's Metrication Clearinghouse Opens Its Doors

Announcing the AASHTO Metrication Clearinghouse.

On June 7, 1994 the Texas Transportation Institute's proposal for operating the American Association of State Highway Transportation Officials (AASHTO) metrication clearinghouse was approved. This pilot clearinghouse was established to serve State Departments of Transportation, Tribal Governments, and the Federal Highway Administration.

Why a clearinghouse?

The Federal Highway Administration (FHWA) mandates that all federal-aid highway project plans, specifications, and estimates be converted to metric units by October 1, 1996. State DOTs and AASHTO must convert their standards, specifications, publications, equipment, and software to metric. What an undertaking! The clearinghouse will ease the transition by cen-

(continued on page 4)

McPrimer for Windows Now Available!

McPrimer for Windows follows a similar format to the popular McPrimer (for DOS). The text is easy to read and contains many screen shots and graphics to illustrate and clarify points. Each chapter has hands-on exercises and review questions at the end (with answers in the appendix). Topics include:

- Hardware
- File Basics and Hard Drives
- Looking into Windows
- Program Manager
- File Manager
- Window Dressing (Control Panel)
- Printing
- Accessories
- Optimization and Tips

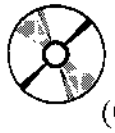
McPrimer for Windows is an excellent introduction for someone new to personal computing or for someone with PC experience but new to Windows. McPrimer explains all the essentials to properly navigate Windows and tap into all its possibilities.

McPrimer for Windows is priced at $20 (Product No. MCPWIN) from:

McTrans Center
University of Florida
512 Weil Hall
Gainesville, FL 32611-6585
Phone: (904) 392-0378
Fax: (904) 392-3224

Educational Discounts of 25% are available.♦

News & Views



Give CD-I a Try!

Compact disc-interactive (CD-I) training is the latest in training technology, and it's here for you to try. The Alaska T2 Program has CD-I training packages for *Snow and Ice Control and Traffic Control in Construction Work Areas*. Give us a call or visit any Roadshow location to test your knowledge. CD-I is easy and fun to use, but—watch out—you might learn something! ♦

Research in Alaska

Copies of reports for any Alaska DOT&PF sponsored research projects are available for loan from the Alaska T2 library's Statewide Research Report collection. To borrow reports or for more information, contact Susan Earp at (907) 451-5320.♦

Alaska T2 Has SHRP Work Zone Safety Devices

The Alaska T2 center has samples of Strategic Highway Research Program (SHRP) work zone safety devices including:

- direction indicator barricades
- opposing traffic lane dividers
- flashing stop/slow paddles
- intrusion alarms
- snow fence

If you would like to borrow these materials, please contact Sharon McLeod-Everette, Director, at (907) 451-5323. In return for borrowing the devices, the Alaska T2 Program would like reports on the benefits and concerns regarding the device.

A van with samples of each of the SHRP Work Zone devices will be stopping at construction sites around Alaska and Yukon Territory, Canada June/July. Contact Jim Bennett, Engineer, at (907) 451-5322 for more information.♦

Get the Right Message About Metric

One of the most frequently asked questions about metric conversion is, "are we really going to go through with it this time?" Based on actions so far, the answer has to be "YES!" Both Congress and the President are firmly behind metric conversion.

Also, the support by the private sector is much stronger than in the '70s. Most people are surprised to hear that 30 percent of American products are already metric! Examples can be found in the auto and farm equipment industries, and the scientific and medical community, which use metric units almost exclusively.

News releases distributed recently have implied that the federal conversion effort is once again postponed and may fade away. But a review of the articles reveals that the focus of discussion relates only to the MESSAGE shown on traffic signs.

The Federal government decided to delay a decision about changing sign messages to metric until after 1996. In the meantime all agencies will continue their conversion activities in those areas relying on Federal funds.

So get the right message about metric conversion, which is that it's very much active and still underway!

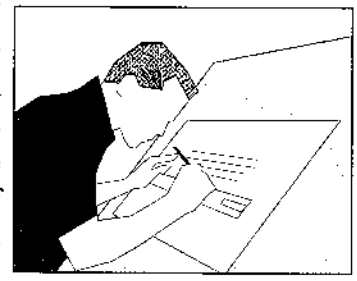
Excerpted from the "Pothole Gazette" Indiana T2 Newsletter, December 1994.♦

Problem Profile: "Hard vs. Soft Conversion" (continued from page 1)

with industry to avoid creating economic burdens for suppliers. For example, to produce a sign with metric dimensions, a signmaker must undergo the expensive process of purchasing new equipment or retooling existing equipment. Rogers believes that, in order to sell the idea of metric conversion to industry, DOTs must offer a secure (and potentially broadened) market in exchange for industry's initial investment. In a nation of noncoordinated hard conversions where national decisions are still in the works, this market cannot exist. With soft conversions, however, industry can produce metric equivalents with their existing equipment and delay their investment in new equipment until a national consensus is reached.

From Rogers' point-of-view, the temporary use of soft conversions is necessary to implement a well-organized metrication effort. He does acknowledge, however, that soft conversion imposes its own set of difficulties upon TxDOT. Because of unrounded and oftentimes unwieldy values, soft conversion tends to perpetuate the use of the English system of measurement—employees find the old, rounded English values easier to remember. Of greater importance, says Rogers, is the fact that soft conversion delays the benefits of metrication because it is simply a renaming of English values and not a true restandardization.

Rogers stresses that TxDOT wants to eventually gain full benefits of metrication that only hard conversion can offer. With this goal in mind, the department is working to further the national adoption of such standards. Like other state DOTs, TxDOT maintains membership with AASHTO and ASTM, responds regularly to metrication items posted in the *Federal Register* for comment, and supports the information-gathering tasks of the Metrication Clearinghouse.



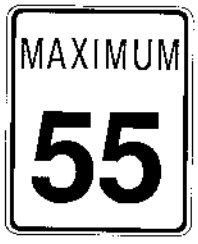
Looking over the entire metrication process, Rogers terms the choice to preliminarily adopt soft conversions as "frustrating." "Economically," he continues, "(TxDOT) can't make any other choice. (We) don't want to have a negative impact on industry." In fact, TxDOT has chosen "Opportunities for Improvement" as its metric conversion theme to reflect its desire to make a positive impact. Rogers wants to realize those opportunities, but warns that unless metrication is well-planned and established at a national level, "it will be our worst nightmare."

Reprinted from the "AASHTO Metrication Clearinghouse Newsletter," December 1994. ♦

Metric Conversion of Signs Delayed

Public Opposes Converting English Measurement Signs to Metric

The Federal Highway Administration (FHWA) announced in the June 27, 1994 *Federal Register* that it will delay implementation of and metric sign conversion until after 1996, or until congressional action is announced.



According to the notice, FHWA based its decision on numerous comments received from the public that were opposed to converting English measurement signs to metric. They also cited the current freeze on metric conversion for 1994, and pending legislation in the House that places restrictions on the use of federal funds for future conversion.

The notice states that FHWA will not require the implementation of metric sign legends until at least after 1996. The agency will also consider other measures to ensure that a conversion would be run smoothly.

The FHWA solicited comments from the public on three options it was considering for metric conversion:

- **Option 1:** Extended conversion over a 4-7 year period through routine sign replacement.
- **Option 2:** A quick, coordinated conversion effort over 6 months to a year.
- **Option 3:** A two-phased process using dual posting of both metric and English to be completed by September 30, 1996.

The FHWA received nearly 3,000 comments on the docket on these options. Most comments referred to cost, while 86% of the comments were in opposition to converting to metric. A total of 45 states responded with 36 expressing support for a switch to metric, with most supporting Option 2. Most states also requested special funding and a public education program.

Reprinted from the "ATSSA Signal," September, 1994. ♦

AASHTO's Metrication Clearinghouse
(continued from page 1)

tralizing communication among the various governments.

Information, Information, Information

The clearinghouse is collecting and cataloging metrication information including AASHTO standards and publications, FHWA standards, metric conversion plans, member department metrication contacts, and conferences, meetings, and training courses.

What the Clearinghouse Can Do For You

The clearinghouse can:

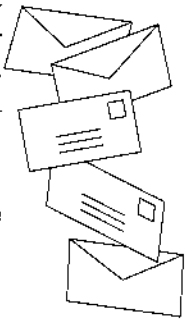
- provide copies of metrication information upon request
- provide larger metrication documents at cost
- track metrication issues interesting to members of the transportation community
- direct you to an appropriate contact or authority
- and inform you of upcoming metrication events, meetings, and training courses.

Look for the Clearinghouse on the AASHTO VAN

The clearinghouse offers information directly on AASHTO's Value Added Network (AASHTO VAN). Here you will find recent copies of the clearinghouse newsletter, quarterly survey results of metrication coordinators, a monitored interactive forum for metrication issues, selected bibliographics, a directly of metrication contacts, and a calendar of pertinent events.

What If I Have A Question?

If you have any questions, concerns, or comments, please direct them to the clearinghouse staff at:



AASHTO Metrication
Clearinghouse
Texas Transportation
Institute
707 Texas Avenue South #106D
College Station, Texas 77840
Ph: 409/ 845-5770
Fax: 409/ 845-9848

The clearinghouse can also be reached through e-mail via Internet to lenora@ttiadmin.tamu.edu or via AASHTO VAN to LENORAG.

Adapted from "AASHTO's Metrication Clearinghouse Newsletter," August 1994. ♦

ALASKA TRANSPORTATION
TECHNOLOGY TRANSFER
Local Technical Assistance Program
Department of Transportation and Public Facilities
2301 Peger Road M/S 2550
Fairbanks, AK 99709-5399

address correction requested

BULK RATE
U.S. Postage
PAID
Fairbanks, AK
Permit No. 87

RESEARCH NEEDS AND METRIC TIPS _____ 1994

No. 34

Alaska Transportation Research Needs Reviewed

by George Levasseur, South Central District Manager, DOT&PF-M&O

In late September, the research subcommittees from headquarters and the three regional offices of the Alaska Department of Transportation and Public Facilities (DOT&PF) met to review research needs statements. Over fifty research needs statements had been submitted by DOT&PF offices, the University of Alaska Fairbanks (UAF), and the Alaska Department of Environmental Conservation (DEC). The needs statements were ranked for consideration by the Statewide Research Committee.

The Statewide Research Committee met on October 4 and ranked the top 27 projects. Board members performing the project evaluations were Mal Linthwaite, David Sterley, Mike Tooley, and George Levasseur, DOT&PF, and Steve Boch, FHWA. The meeting was chaired by Dave Esch, DOT&PF Research Applications Engineer. There appears to be funding available for ten new projects.

1. Air Convection Embankment Design. This project, submitted by Doug Goering (UAF) and Bob McHattie (DOT&PF), involves new techniques for the design of roadway embankments in permafrost areas. The new designs use high permeability aggregate to promote natural convection through the embankment during the winter months to limit thawing of the underlying permafrost.

2. Evaluation of Rutting Potential of Alaskan Asphalt Mixtures for Selected Urban Areas. This project was submitted by R.B. Leahy (UAF) and Dave Esch (DOT&PF). Rutting of asphalt mixtures continues to be a significant problem in Alaska, especially in the Anchorage area. This study is intended to evaluate the effect of asphalt type, aggregate gradation, and aggregate fracture on the rutting potential of Alaskan asphalt mixes.

3. Fish Passage Structure Evaluation. Steve Horn and Billy Connor (DOT&PF) will join forces to analyze fish passage structures for culverts to find designs that will meet hydraulic flows and still meet fish passage requirements mandated by the Alaska Department of Fish and Game. Culverts can often be designed to effectively pass the design flow at a fraction of the cost of constructing a bridge.

4. Moose River Oil and Grit Separator Evaluation. Steve Horn (DOT&PF) proposes to determine the conditions under which petroleum separators can be effective in reducing stormwater effluent. Considerable time is being spent in design to meet current DEC standards for stormwater runoff.

5. Benefits of Lightweight Tire Studs. Steve McKinstry (DOT&PF) will conduct comparison tests of lightweight tire studs to evaluate them for traction, endurance, and the extent of pavement wear they cause.

6. Handicap Access Alternatives. Rod Wilson (DOT&PF) will research crosswalk technology in the design and construction of curb ramps and tactile delineators. He will evaluate the new designs for utility to disabled persons and for compliance with the new federal mandates related to the Americans with Disabilities Act (ADA).

7. Cold Temperature Auto Oxy-Fuels. Jerry Imm (DEC) will research ethanol as an oxygenating additive for gasoline to reduce harmful automotive emissions. Public concerns caused state government officials to cancel the use of methyl-tertiary-butyl-ether (MTBE) as an additive, leav-

ing alcohol/gasoline mixtures as a likely solution to problems of carbon monoxide emissions from automobiles.

8. Development of Seed Stocks of Native Species. Stoney Wright from the UAF Plant Materials Center will investigate native vegetation species suitable for planting on highway rights-of-way. Seeds from these native species will be collected and made suitable for commercial production. These seeds will be used in construction revegetation work.

9. Experimental Erosion Control Measures. Ann Williams (DOT&PF) will research new methods for river control where good riprap sources are lacking, as is the case along the Tanana River near Fairbanks. Long hauls for large rock escalate the cost of riprap placement.

10. Weigh-In-Motion (WIM) and Scale House Data Processing. Dave Esch and Eric Johnson (DOT&P) will develop a method to process several years of electronic data from WIM sites and scale houses. This data will lead to better pavement performance prediction models for the Pavement Management System.

FYI: Helpful Hints for Metric Conversion

Mass/Force

Probably one of the most difficult concepts to master when converting from the English system of units to the Metric system of units is knowing how and when to change **pound (mass)** and **pound (force)** to **kilograms** and **newtons**. Below are guidelines and examples to aid in the task.

Given	Convert to	Multiply by
Pound (mass)	Kilograms (kg)	0.4536
Pound (force)	Newtons (N)	4.4482

In the English system of units there is generally no distinction made between **pound (mass)** and **pound (force)**; they are considered the same. Why? For locations on the earth's surface, a **pound (mass)** is defined as the amount of mass needed to create a gravitational force of one pound. Thus, the effects of gravity are included in the measurement unit by definition. The gravitational force on an object of a certain mass is what we commonly call the object's "weight."

In the metric system a distinction is made when labeling mass and force. Mass is referred to as **kilograms**, and force is referred to as **newtons**. The **newton** incorporates the effect of gravity on a mass. The **kilogram** does not incorporate gravity and is simply a measure of mass. Because of the way the metric system is devised, the two metric measurements **do not have the same numerical value** as the common English measurements.

When converting from English to metric units, examine the label that follows pound. If **pound (mass)** is used, or if pound is used alone with no label, then we can be fairly certain that mass is being reported. This quantity can be converted directly to kilograms. If **pound (force)** is used, then we can convert to newtons.

A final note: Because the numerical value of **pound (mass)** and **pound (force)** are the same for most locations on the surface of the earth, either can be converted to newtons or kilograms. The important thing is not what you are converting from, but what you want to report in the metric system. If you need mass, then convert to kilograms, and if you need force, convert to newtons. Remember, an object has the same **mass (kilograms)** on the earth as it does on the moon. However, it will not weigh the same **(newtons)** because the force of gravity is different.

Example: Calculation of Mass

The snowplow and your truck weighs 2100 pounds (mass). How many kilograms are there in those 2100 lbs?

$$2100 \text{ lb.} \infty 0.4536 = 952.56 \text{ kg}$$

Example: Calculation of Force

You have to pull on a rope with a 40 pound (force) to lift a bucket of water. How many newtons would it take?

$$40 \text{ lb.} \infty 4.4482 = 177.93 \text{ N}$$

If you are given "pound" and the "mass" or "force" is not specified, change the quantity to kilograms.

Reprinted from the "Wyoming T2 Newsletter," Fall 1994.

For More Information

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.

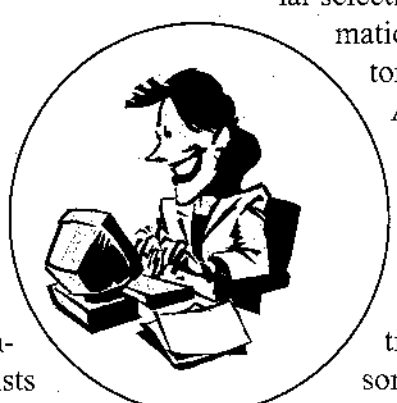
Computer Access to ITE Traffic Engineering Resources

A broad spectrum of traffic engineering information—from technical assistance on traffic control systems to the full text of federal laws that most affect transportation—is now just a phone call away.

The ITE Urban Traffic Engineering Clearinghouse, established in October 1992 by the Institute of Transportation Engineers ITE) and the U.S. Federal Highway Administration (FHWA), consists of two main components—a technical request service and an electronic bulletin board.

While the primary focus is on urban traffic engineering systems, the Clearinghouse offers such a wide range of transportation information that smaller cities and rural transportation agencies should find it to be a valuable resource. Anyone, ITE members and nonmembers alike, can use the system. All that is necessary is a computer and a modem.

Technical Request Service



The technical request service (now processing more that 100 requests per month) provides 4,000 ITE publications, including ITE journal articles, meeting papers and reports. For questions regarding more than a key word entry, ITE technical staff will generate lists of resources by author or major subject area, or refer callers to organizations more appropriate to the resources requested.

Electronic Bulletin Board Service

The ITE Bulletin Board Service (ITE BBS), can be accessed through the telephone number (202) 863-5487. Anyone who has a microcomputer with communications software and a modem operating at 300, 1200, or 2400 baud, full duplex, has unlimited access to the system. Other settings such as data bits and stop bits need no adjusting on the part of the user. The system adjusts to the user's present settings.

First-time callers select a password and complete a brief questionnaire before the system directs them to the bulletin menu.

To read bulletins, users key in the number corresponding to the bulletin of interest. Upon completion, the system returns you to the main menu which includes a variety of other available options.

From the files menu, users can select such categories as Positions Available and Wanted, Legislative Information, Continuing Education Information, ITE Information, and a series of miscellaneous files that include lists of FHWA fax numbers, free transportation-related reports from the GAO, and other transportation-related electronic bulletin board systems.

Most Popular Files

ITE Clearinghouse staff report that the file containing current information on student jobs available through ITE and the TRAC program is the most popular selection. A close second is legislative information, samples of which include Washington reports, the full text of the Clean Air Act Amendments Title I, an overview of ISTEA, and a list of EPA hotlines and technical assistance lines, among many others.

While most bulletin board users successfully locate answers to their questions after searching accessible files, some questions require a more personal touch. For those, a general mailbox has been set up where messages can be sent and answers retrieved by all registered bulletin board users.

Further enhancements are planned for the Clearinghouse. Already in the works are plans to coordinate ITE's Central Clearinghouse with otherestablished information clearinghouse such as the Transportation Research Board's TRIS, the IVHS America Information Clearinghouse, and the American Public Works Association (APWA) Clearinghouse.

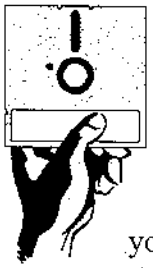
For more information about the ITE Urban Traffic Engineering Clearinghouse, call (202) 554-8050 and ask for the Clearinghouse.

Reprinted with permission from "Tech Transfer," January 1994.

When Can You Copy Software?

by Cliff Watts, Computer Resource Specialist

Let's say you are visiting with a friend who has a computer. As you're leaving, your friend hands you some disks containing several popular software programs and says, "Here's some stuff you might want." Your thoughts may well be, "Wow, did I save a lot of money!"



You are probably right about the cost. But you and your friend may have just committed a crime. To understand why this may be a criminal act, you need to know about the three major types of software programs.

Shareware

To avoid the expenses of formally marketing their software, many authors sell their software as "shareware" through inexpensive channels (e.g., computer bulletin boards). If you decide to keep the software, you are expected to pay the author a fee. In exchange, many authors will send you manuals or an updated version of the program.

Public domain software

This is the only software that is legal to freely duplicate. There is no obligation to pay a license fee.

Commercial software

Often referred to as "shrink wrapped," this software is only sold legally through channels recognized by the manufacturer, such as your local computer store. It includes complete packaging and documentation. It is generally illegal to copy this type of software for use by others.

Besides wanting to save money, there are many reasons why people illegally copy commercial software:

- They don't know the law. Many people don't realize that they've only purchased a license to use the software and don't actually own the copy itself.
- They feel that software companies charge too much for their products.
- They have a legal copy at work and want to have another copy at home.
- They want to sell the software for a profit.

There is a simple way to tell if a piece of software is legal. Read the license agreement, which is normally printed on the disk envelop. Most commercial software will display a message when you start the program that tells you if the software is licensed to a particular user. If it is, then that user is probably not authorized to give or sell you a copy.

Ask the person who gave you the disk where they got the software and is it a legal copy. Remember that sharing disks is one way to catch a "computer virus." Major software companies estimate that up to half of the copies of their software in existence are illegally duplicated.

In response to protest from consumers, nearly all manufacturers, except those that make games, have removed copy protection. The rules about making back-ups vary by manufacturer, so be sure to read the license agreement.

Software piracy is one of the few crimes routinely committed by "model citizens." And software disks are probably the only product you buy for which you own the means of making a perfect reproduction. But that doesn't make it legal.

Obviously, software piracy is also a concern in the workplace. If a company encourages criminal activity, either through willful conduct or negligence, it may be held liable.

Reprinted with permission from Dave Munson, Marketing Manager, Eide Helmeke PLLP, Certified Public Accountants and Consultants, Fargo, ND, as printed in "Link 'n Nodes," Fall 1994, Volume 5, Number 2.

For More Information

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.

1995 AASHTO-FHWA National Metric Conference: Phoenix, Arizona February 21-24

by Gene Rehfield, State Metric Coordinator, Alaska DOT&PF

As the State Metric Coordinator for the Alaska Department of Transportation and Public Facilities (DOT&PF), I recently was privileged to attend the second annual National Metric Conference. There was a large attendance with about 300 delegates representing state DOTs, county and municipal agencies, the American Association of State Highway Transportation Officials (AASHTO), the Federal Highway Administration (FHWA), contractors, manufacturers and industry associations. The topic of the meeting was the implementation of the metric system in the transportation industry.

In a moment, I'll summarize some of the highlights from the conference. But first, I'd like to mention some insights that I gained from attendance. For me, in my role of Metric Coordinator, it was valuable to learn that the metrication effort undertaken by the Alaska DOT&PF is exactly the same task faced by all the state DOTs. Learning what has worked, or what may have failed in the metrication efforts of other state DOTs can make our efforts more productive. Most of the challenge in my coordination role comes in providing advice to the other regional metric coordinators on specific questions. It is impossible to relate all the events of the four day National Metric Conference. There is too much to tell, and it's hard to know what each of you may be most interested in. But I do know that as a result of attending the National Metric Conference I am better equipped to answer your questions about what's happening with the metric system.

Highlights from the conference:

- All state DOTs have converted their Standard Plans, Specifications and Design Manuals to metric.

- Some states have developed a metric logo for Plans and Specifications to clearly identify the units for contractors.

- State DOTs and some federal agencies are ready to go metric. Many county, municipal and utility construction partners are not ready.

- There is presently no coordinated way to reach metric construction material vendors. It was suggested that there is a need for state DOTs to be aware of what products are available in metric designations.

- Some states are significantly ahead of others in their metrication efforts because of their well staffed metric programs.

- AASHTO members can use the Metric Clearinghouse, either by fax, phone or e-mail at:

  AASHTO Metrication Clearinghouse
  Texas Transportation Institute
  707 Texas Avenue South #106D
  College Station, Texas 77840
  Ph. 409/845-5770
  Fax 409/845-9848
  via e-mail
  Internet: lenora@ttiadmin.tamu.edu
  AASHTO VAN: LENORAG

Metric construction pilot projects discussed at the conference included GSA Hospital, Customs Houses, and Court House projects budgeted in hundreds of millions of dollars. State DOTs have begun metric construction projects with budgets ranging from hundreds of thousands to hundreds of millions of dollars.

There are no clear relationships between difficulty, cost, or time due to the change to the metric system. It was stated at the conference that material suppliers, contractors and designers are ready to supply products and services in the metric system. They expect that the conversion will be a "non-event," with the exception of existing inventory designated with english units.

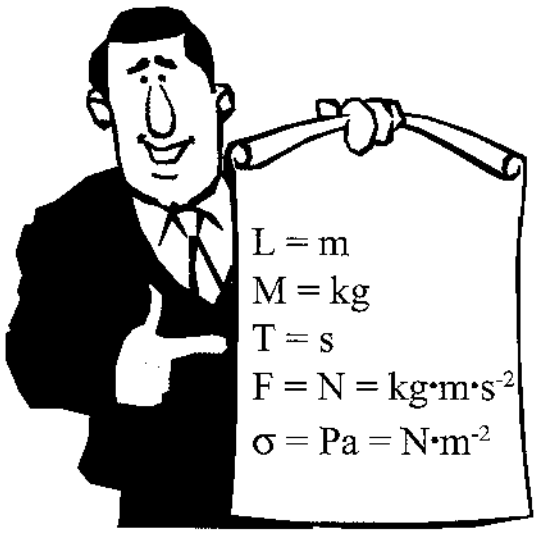
If the federal government stays behind its commitment to go metric in 1996 (and there is some question related to the wavering that resulted in the U.S. abandoning Canada during the metrication effort in the mid 1970's) the sense from the National Metric Conference was that all sectors of the economy should be swept up in the metric system in a short period of time. The message that came across loud and clear was that government should not try to force people to use the metric system. We should change our tack from "It's a federal requirement," to "It's good business to use the metric system."

Metric: Let's Get it Right

Here are the rules for writing metric symbols, names, and numbers and for pronouncing metric names, as provided by the U.S. Metric Association and the American National Metric Council.

Writing Metric Symbols and Names

- Print unit names in lower case, even those derived from a proper name (meter, kilogram, second, kelvin, newton, pascal).
- Print unit symbols in upright type and in lower case except for liter (L) or unless the unit name is derived from a proper name (m, kg, s, K, N, Pa).
- Print decimal prefixes in lower case for magnitudes 10^3 and lower (that is, k, m, m, and n) and print the prefixes in upper case for magnitudes 10^6 and higher (that is, M and G).
- Leave a space between a numeral and a symbol (for example, write 45 kg or 37 °C, not 45kg or 37°C).
- Do not use a degree mark (°) with kelvin temperature (write K, not °K).
- Do not leave a space between a unit symbol and its prefix (write kg, not k g).



- Do not use the plural of unit symbols (write 45 kg, not 45 kgs), but do use the plural of written names (several kilograms).
- For technical writing, use symbols in conjunction with numerals (the area is 10 m^2); write out unit names if numerals are not used (carpet is measured in square meters). Numerals may be combined with written unit names for nontechnical writing (10 meters).
- Do not mix names and symbols (write N·m or newton meter, not N·meter).
- Indicate the product of two or more units in symbolic form by using a dot positioned above the line ($kg \cdot m \cdot s^{-2}$).
- Do not use a period after a symbol (write "12 g", not "12 g.") except where it occurs at the end of a sentence.

Writing Numbers

- Always use decimals, not fractions (write 0.75 g, not ∫ g).
- Use a zero before the decimal marker for values less than one (write 0.45 g, not .45 g).
- Use spaces instead of commas to separate blocks of three digits for any number over 4 digits (for example, 45 138 kg or 0.004 46 kg or 4371 kg). Note that this does not apply to the expression of amounts of money.
- In the United States, the decimal marker is a period; in other countries a comma usually is used.

Pronunciation

candela - Accent the second syllable: can-**dell**-ah.

hectare - Accent the first syllable: **heck**-tare. The second syllable rhymes with **care**.

joule - Rhymes with **pool**.

kilometer - Accent the first syllable: **kill**-o-meter.

pascal - Rhymes with **rascal**.

siemens - Sounds like **seamen's**.

Reprinted from "Metric in Construction," the newsletter of the Construction Metrication Council of the National Institute of Building Sciences. September-October 1994.

Note: The July-August 1994 edition of "Metric in Construction" has an article on conversion, rounding and the implied tolerances of measurements, and is available from the T2 library.

For More Information

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.

NEW PUBLICATIONS AVAILABLE FOR LOAN ___ 1994

No. 37

Place a check by the publications you wish to borrow.

____ **Arizona Bicycle Facilities Planning and Design Guidelines**, ID-1208, Facilities Planning Committee, Arizona Bicycle Task Force, November 1, 1988.

____ **Bicycle Compatible Roadways-Planning and Design Guidelines**, ID-1213, the New Jersey Department of Transportation, December 1982.

____ **Bikeway Planning and Design**, ID-1209, Chapter 1000, Highway Design Manual, California Department of Transportation, July 1, 1990.

____ **Consumers Guide to Dust Control Technologies**, ID-1211, CR-R 89034, Arizona Department of Environmental Quality, June 1989.

____ **Continuing Project on Legal Problems Arising Out of Highway Programs**, ID-1205, NCHRP Legal Research Digest, Transportation Research Board, National Research Council, 1993.

____ **Design and Construction Criteria for Bikeway Construction**, ID-1207, 23 CFR Parts 625, 652 and 663, Federal Register, Vol. 45, No. 151, Monday, August 1980, Department of Transportation, Federal Highway Administration, FHWA Docket No. 79-3, Notice 2.

____ **Development and Testing of a Seismic Pavement Analyzer**, ID-1202, SHRP-H-375, Strategic Highway Research Program, National Research Council, December 1993.

____ **Development and Validation of Performance Prediction Models and Specifications for Asphalt Binders and Paving Mixes**, ID-1219, SHRP-A-357, Strategic Highway Research Program, National Research Council, October 1993.

____ **Development of Micro-Based Interactive Computer Programs - Hydraulics**, ID-1198, OHIO/HWY-04/93, HY-3-93, Final Report, Ohio Department of Transportation, The University of Akron, Department of Civil Engineering, March 15, 1993.

____ **Driver Performance: Measurement and Modeling, IVHS, Information Systems, and Simulation**, ID-1217, Transportation Research Record No. 1403, Operations and Safety, Transportation Research Board, National Research Council, 1993.

____ **Factors Affecting Properties and Performance of Pavements and Bridges 1991**, ID-1215, Transportation Research Record No. 1301, Materials, Construction, and Maintenance, Transportation Research Board, National Research Council, 1991.

____ **Field Demonstrations of Advanced Data Acquisition Technology for Maintenance Management**, ID-1206, NCHRP Report 361, Transportation Research Board, National Research Council, 1993.

____ **Fundamental Properties of Asphalt-Aggregate Interactions Including Adhesion and Absorption**, ID-1200, SHRP-A-341, Strategic Highway Research Program, National Research Council, December 1993.

____ **Highway and Traffic Safety and Accident Research, Management, and Issues**, ID-1216, Transportation Research Record No. 1401, Safety and Human Performance, Transportation Research Board, National Research Council, 1993.

____ **Integrating Transportation Management Systems into Transportation Planning and Operations National Conference Proceedings**, ID-1203, Vanderbilt Engineering Center for Transportation Operations and Research, Vanderbilt University, Sheraton Music City Hotel, Nashville, TN, November 7-10, 1993.

____ **Large-Vehicle Safety Research**, ID-1218, Transportation Research Record No. 1407, Safety and Human Performance Public Transit, Transportation Research board, National Research Council, 1993.

____ **Mechanical Behavior of High Performance Concretes: High Early Strength Fiber Reinforced Concrete**, ID-1225, SHRP-C-366, Volume 6, Strategic Highway Research Program, National Research Council, October 1993.

____ **Mechanical Behavior of High Performance Concretes: Summary Report**, ID-1220, SHRP-C-361, Volume 1, Strategic Highway Research Program, National Research Council, October 1993.

____ **Mechanical Behavior of High Performance Concretes: Production of High Performance Concrete**, ID-1221, SHRP-C-362, Volume 2, Strategic Highway Research Program, National Research Council, November 1993.

____ **Mechanical Behavior of High Performance Concretes: Very High Strength Concrete**, ID-1224, SHRP-C-365, Volume 5, Strategic Highway Research Program, National Research Council, November 1993.

____ **Mechanical Behavior of High Performance Concretes: High Early Strength Concrete**, ID-1223, SHRP-C-364, Volume 4, Strategic Highway Research Program, National Research Council, December 1993.

____ **Mechanical Behavior of High Performance Concretes: Very Early Strength Concrete**, ID-1222, SHRP-C-363, Volume 3, Strategic Highway Research Program, National Research Council, November 1993.

____ **New Jersey Bicycle Manual**, ID-1212, Motor Vehicle Services, February 1993.

____ **New Jersey Bicycling Information**, ID-1214, New Jersey Department of Transportation.

____ **Pavement Maintenance Effectiveness**, ID-1199, SHRP-H-358, Strategic Highway Research Program, National Research Council, November 1993.

____ **Pavement Management and Weigh-in-Motion**, ID-1210, Transportation Research Record 1200, Transportation Research Board, National Research Council, 1988.

____ **Seismic Pavement Analyzer Operations Manual with Technical Specifications**, ID-1201, SHRP-H-374, Strategic Highway Research Program, National Research Council, December 1993.

____ **Stal- og betongelementer I losmassetunneler**, ID-1204, Publikasjon nr. 69, Staten vegvesen Vegdirektoratet, Veglaboratoriet.

____ **Structural Characterization of Asphalt Overlays Placed on Heavily Trafficked Concrete Pavements**, ID-1197, FHWA-RD-91-029, U.S. Department of Transportation, Federal Highway Administration, December 1993.

These publications may be borrowed for three weeks. However, if you need the materials longer, just contact our office for an extension. Questions? Contact **Susan Earp** at (907) 451-5320 or TDD: (907) 451-2363.

Please print your name and address below, and mail or fax to:

Alaska Transportation Technology Transfer Program
Local Technical Assistance Program
Department of Transportation and Public Facilities
2301 Peger Road M/S 2550
Fairbanks, Alaska 99709-5399
FAX: (907) 451-2313

Name:_____ **Title:**_____ **M/S:**_____
Organization:_____
Address:_____
City:_____ **State/Province:**_____ **Zip:**_____
Phone:_____ **Fax:**_____

For More Information

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.

NEW VIDEOS AVAILABLE FOR LOAN _____ 1994

No. 37

Place a check by the videotapes you wish to borrow.

____ **Asphalt Maintenance Techniques**, ID-271, Video University Productions, Missouri, 1993, 85 min.

____ **Batch Plant Maintenance**, ID-266, Video University Productions, Missouri, 1992, 60 min.

____ **Drum Mixer Plant Maintenance**, ID-265, Video University Productions, Missouri, 1992, 60 min.

____ **Here's How a Hot Mix Plant Works**, ID-268, Video University Productions, Missouri, 1992, 55 min.

____ **How to Prevent Segregation**, ID-267, Video University Productions, Missouri, 1992, 26 min.

____ **Maintaining Asphalt Roads/Blade Patching**, ID-262, New Mexico Department of Transportation, January 25, 1993, 11:45 min.

____ **Paving and Compaction Training**, ID-264, Video University Productions, Missouri, 1992, 43 min.

____ **Paving Techniques**, ID-263, Video University Productions, Missouri, 1992, 37 min.

____ **Selectives Pavement Rehabilitation**, ID-272, Video University Productions, Missiouri, 1992, 34 min.

____ **Special Hot Mixes SMA-ATPB-Rubberized**, ID-270, Video University Productions, Missiouri, 1992, 46 min.

____ **Thermal and Asphalt Cold Mix Treatment of Hydrocarbon Contaminated Soil**, ID-269, Video University Productions, Missiouri, 1992, 59 min.

ADDITIONAL PUBLICATIONS AVAILABLE FOR LOAN

Place a check by the publications you wish to borrow.

____ **Accident Data Analysis of Side-Impact, Fixed Object Collisions**, ID-1232, U.S. DOT/FHWA, FHWA-RD-91-122, May 1994, 102pp., 5cc.

____ **Binder Characterization and Evaluation: Chemistry**, ID-1229, SHRP-A-368, Volume 2, Strategic Highway Research Program, National Research Council, November 1993, 2cc.

____ **Bridge and Hydrology Research 1991**, ID-1228, Transportation Research Record No. 1319, Highway and Facility Design; Bridges, Other Structures, and Hydraulics and Hydrology, Transportation Research Board, National Research Council, 1991, 1cc.

____ **Cathodic Protection of Concrete Bridges: A Manual of Practice**, ID-1230, SHRP-S-372, Strategic Highway Research Program, National Research Council, December 1993, 2cc.

____ **Development of Design Guidelines for Use of Shredded Tires as a Lightweight Fill in Road Subgrade and Retaining Walls**, ID-1233, University of Minnesota, Center for Transportation Studies, Report Number 94-04, 137pp., 1cc.

____ **Field Manual for Maturity and Pullout Testing on Highway Structures**, ID-1227, SHRP-C-376, Strategic Highway Research Program, National Research Council, December 1993, 1cc.

____ **Maintenance Work Zone Safety Devices Development and Evaluation**, ID-1231, SHRP-H-371, Strategic Highway Research Program, National Research Council, November 1993, 2cc.

____ **Optimization of Highway concrete Technology**, ID-1226, SHRP-C-373, Strategic Highway Research Program, National Research Council, January 1994, 1cc.

____ **Pavement Surface Courses, Stone Mastic Asphalt Pavements, and Asphalt Concrete Recycling**, ID-1234, Transportation Research Record 1427, Transportation Research Board, National Research Council, 1993, 60pp., 1cc.

____ **Early Analyses of LTPP General Pavement Studies Data: Executive Summary**, ID-1235, SHRP-P-392, Strategic Highway Research Program, National Research Council, April 1994, 32pp., 1cc.

____ **Development of Anti-Icing Technology**, ID-1236, SHRP-H-385, Strategic Highway Research Program, National Research Council, April 1994, 479pp., 1cc.

____ **The Superpave Mix Design Manual for New Construction and Overlays**, ID-1237, SHRP-A-407, Strategic Highway Research Program, National Research Council, May 1994, 172pp., 1cc.

____ **Ground Penetrating Radar Surveys to Characterize Pavement Layer Thickness Variations at GPS Sites**, ID-1238, SHRP-P-397, Strategic Highway Research Program, National Research Council, April 1994, 50pp., 1cc.

____ **Evaluation on the AASHTO Design Equations and Recommended Improvements**, ID-1239, SHRP-P-394, Strategic Highway Research Program, National Research Council, April 1994, 214pp., 1cc.

____ **Binder Characterization and Evaluation, Volume 3: Physical Characterization**, ID-1240, SHRP-A-369, Strategic Highway Research Program, National Research Council, April 1994, 475pp., 1cc.

____ **Concrete Bridge Protection, Repair, and Rehabilitation Relative to Reinforcement Corrosion: A Methods Application Manual**, ID-1241, SHRP-S-360, Strategic Highway Research, National Research Council, October 1993, 268pp., 2cc.

____ **Concrete Bridge Protection and Rehabilitation: Chemical and Physical Techniques - Corrosion Inhibitors and Polymers**, ID-1242, SHRP-S-666, July 1993, 249pp., 3cc.

These publications may be borrowed for three weeks. However, if you need the materials longer, just contact our office for an extension. Questions? Contact **Susan Earp** at (907) 451-5320 or TDD: (907) 451-2363.

Please print your name and address below, and mail or fax to:

Alaska Transportation Technology Transfer Program
Local Technical Assistance Program
Department of Transportation and Public Facilities
2301 Peger Road M/S 2550
Fairbanks, Alaska 99709-5399
FAX: (907) 451-2313

Name:_____ **Title:**_____ **M/S:**_____
Organization:_____
Address:_____
City:_____ **State/Province:**_____ **Zip:**_____
Phone:_____ **Fax:**_____

For More Information

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.

You should be ALARMED!

The Alaska Department of Transportation and Public Facilities (DOT&PF) recently purchased two models of *Work Zone Intrusion Alarms* and is looking for volunteers to test and evaluate them. The alarms were developed under the Strategic Highway Research Program (SHRP). If an errant vehicle enters a road work zone, a siren is activated to warn workers and hopefully give them time to get out of the way.

One model, the *ASTI Safety Line*, is composed of two battery-operated units mounted on traffic cones:

1. an infrared beam transmitter
2. a receiver/siren

These units can be placed up to 750 feet apart. If the infrared beam between them is interrupted, the 110 dB siren is activated.

Normally the transmitter is placed along the road shoulder at the beginning of a lane closing taper, with the receiver/siren at the other end of the taper near the workers. If a vehicle interrupts the beam between them, the siren immediately warns the workers.

The second model, the *Myrid Safety Sentinel*, is similar except that the units are designed to be mounted on plastic drums, and use microwaves instead of an infrared beam. This system includes solar cells to keep the batteries charged. It also transmits a signal that activates radar detectors within 2,000 feet to encourage drivers to slow down near the work zone.

The DOT&PF hopes to get a number of people, including contractors, to try out the systems. In exchange for the loan of the equipment, users will be asked to complete a brief questionnaire. If you are interested in trying out one of the Work Zone Intrusion Alarms, contact:

Matt Reckard

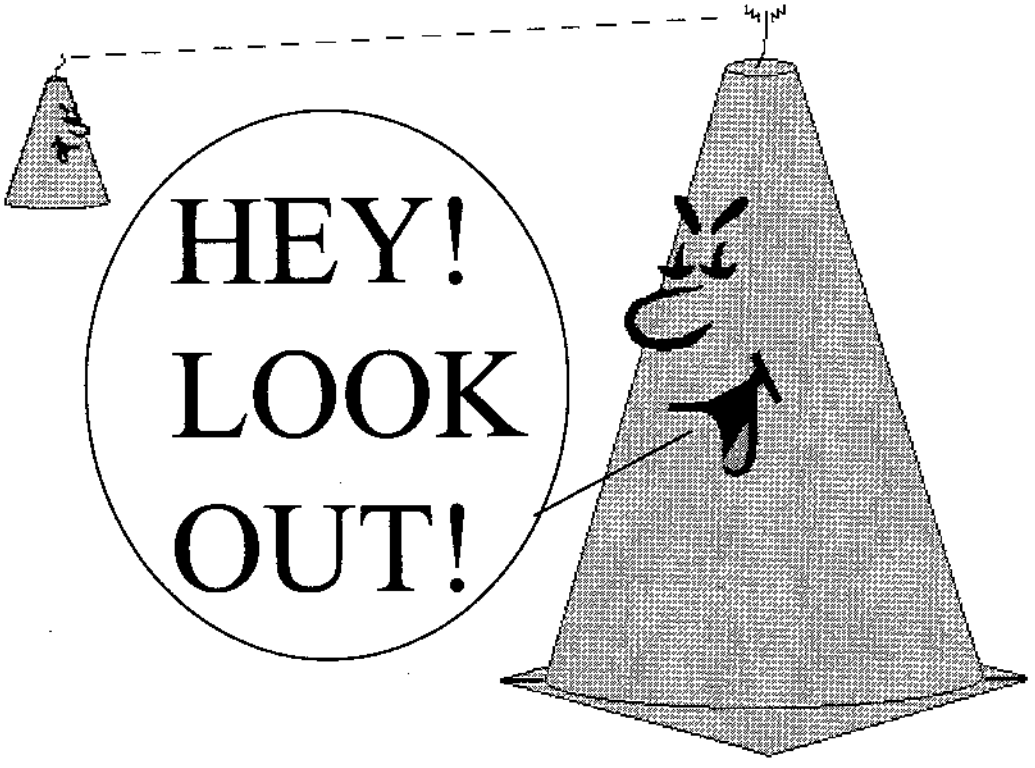
DOT&PF Headquarters

3132 Channel Drive

Juneau, AK 99801

Ph. (907) 465-6951

FAX (907) 465-2460



Alaska Transportation Week Announced

Alaska Transportation Forum Postponed Until 1996

The Alaska Transportation Forum that was originally scheduled for mid June, 1995 has been rescheduled as part of Alaska Transportation Week activities to be held in Anchorage, Alaska April 15-19, 1996. The schedule for the week includes:

- DOT/AGC Meeting—April 15-16, 1996
- Alaska Transportation Forum, sponsored by UAF TRC—April 17, 1996
- Pavement Maintenance: Today's Products and Practices, Tomorrow's Potential; Alaska T2 Program—April 18, 1996
- Pothole Patching: Fix It and Forget It; Alaska T2 Program—April 19, 1996

An Education/Vendor room, to display new products and provide information on new construction techniques, is planned to coincide with the week long event. A panel presentation on Long-Term Pavement Performance (LTPP) is also being planned. The Alaska T2 Program is planning to offer the Pothole Patching class in a couple other locations around the state during the following week. Soldotna and Fairbanks are the tentative sites for these sessions.

Watch for brochures and registration forms in January, 1996.

SHRP Product Demo Trailer Arrives In Alaska Soon

A trailer filled with work zone safety products from the Strategic Highway Research Program (SHRP) will be traveling Alaska's highways this summer. The trailer is expected to arrive in Anchorage during the third week of June, and will remain in Alaska for a couple of months. The products for demonstration will include the intrusion alarm, flashing stop/slow paddles, direction indication barricade, opposing traffic lane divider, portable crash cushion, portable rumble strip, and an all-terrain sign stand. The FHWA is loaning these devices to Alaska T2 so they can be showcased throughout the state. All of these products are listed in the revised Part VI of the *Manual on Uniform Traffic Control Devices* (MUTCD) titled, *Standards and Guides for Traffic Controls for Street and Highway Construction, Maintenance, Utility, and Incident Management Operations.*

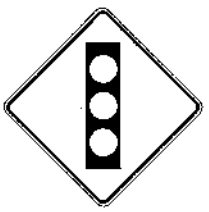
The demonstrations will be of particular interest to state, municipal, and city personnel involved with traffic control for construction work and routine maintenance. The Alaska T2 Program will be contacting agencies for interest in using these new products for testing. Those who are interested will have the opportunity to see these products during scheduled demonstrations. We encourage all state and local government personnel interested in traffic control to attend one of these demonstrations.

If you would like the product demonstration trailer to stop in your area, or have questions about the products, contact Jim Bennett, T2 Program Engineer, at (907) 451-5322. Jim will need information about your location and times that would be convenient for scheduling a demonstration in your area. Both daytime and evening schedules can be accommodated. Contractors can also request visits to job sites along the highway, as we will be travelling the Sterling, Parks, Glenn, Richardson, Tok Cutoff, and Alaska Highways. If there is enough interest, we may travel a portion of the Dalton Highway. We also plan to visit the Shakwak Project in Canada.

Who's Who in Alaska's Transportation

David D. Mumford, Municipal Traffic Engineer,
Municipality of Anchorage Public Works, Anchorage, Alaska

As the Anchorage Municipal Traffic Engineer, David Mumford is responsible for managing the team that keeps traffic flowing smoothly and safely in Alaska's largest city. The Traffic Engineering Division of Anchorage Public Works makes the plans for the safety, channelization, and geometrics of traffic on the cities roads. Mumford's division employs a staff of 52 people to design, operate, and maintain the traffic signals, signage, pavement markings, and the municipal radio communications systems necessary to keep the city's traffic moving efficiently.



Alaska's snow conditions provide many challenges in traffic safety engineering. "The traffic lanes get smaller, striping disappears, and signal timing becomes more difficult," says Mumford, "and the national standards aren't written with Alaskan conditions in mind." Mumford is currently working with consultants to develop new seasonal traffic signal timing guidelines to better manage traffic flow through Anchorage's winter snow and ice conditions.

David D. Mumford was born in Cooperstown, New York and was raised in Buffalo, New York. Mumford studied engineering at Montana State University in Bozeman and during his college years spent a couple of summers working as a fisherman in Cordova, Alaska. He graduated in 1982 with a Bachelor of Science degree in Construction Engineering Technology.

Upon graduation, Mumford again headed for Alaska. He accepted a position in Anchorage as Project Engineer with S & S Engineers, Inc. and worked on a variety of projects including public roadway reconstructions and State of Alaska rural airport housing. In 1984, Mumford moved to a Design Engineer position with Tryck, Nyman & Hayes in Anchorage. His work included subdivision design, public water and sewer projects, and public roadway reconstruction.

In 1986 Mumford accepted a position as Associate Traffic Engineer with the Municipality of Anchorage. He also represented traffic engineering concerns as a member of the Anchorage Metropolitan Area Study Technical Advisory Committee. Mumford accepted his current position as Municipal Traffic Engineer for the Municipality of Anchorage in 1993.

Mr. Mumford is a very active member of the Institute of Transportation Engineers (ITE). He was president of the Alaska Chapter of ITE in 1989 and 1990 and was the Financial Chairman for the ITE District 6 Conference held in Anchorage in 1992. Mumford is currently a member of the ITE Urban Traffic Engineering Committee. He also is a member of the Transportation Research Board and the Local Technical Assistance Program's Alaska Transportation Technology Transfer Center Advisory Board.

Mumford has been married for 11 years to Jeanne Mumford. They have a two year old son named Keenan. Keenan is the only member of the family not currently enrolled at the University of Alaska Anchorage (UAA). Jeanne is a full-time student studying for a degree in Special Education and David is currently pursuing a Master of Science degree in Engineering Science Management at UAA. Mumford says, "it's been a lot of work, but enjoyable" to continue his education.

For rest and relaxation, Mumford enjoys fly tying and fly fishing on the Kenai Peninsula. "Alaska has some excellent trout fishing that most people seem to ignore, and that is fine with me," Mumford says with a laugh. Mumford also enjoys sea kayaking on Prince William Sound.

1995 T2 CALENDAR OF EVENTS

DATE	EVENT	SPONSOR/CONTACT	LOCATION
Feb 1-3, 1995	Fourth World Congress on Coatings Systems for Bridges & Other Steel Stuctures	Missouri Department of Transportation, (314) 341-4200	Marriott Airport Hotel, St. Louis, Missouri
Mar 29-31	Worksite Traffic Supervisors Training Course	ATSSA, (703) 898-5400	West Coast International Inn, Anchorage, Alaska
Apr 3-5	Worksite Traffic Supervisors Training Course	ATSSA, (703) 898-5400	West Coast International Inn, Anchorage, Alaska
Apr 3-7	National Interagency Workshop On Wetlands	US Army Corps of Engineers, (601) 634-2569	Clarion Hotel, New Orleans, Louisiana
Apr 11-13	Worksite Traffic Supervisors Training Course	ATSSA, (703) 898-5400	Fairbanks Princess Hotel, Fairbanks, Alaska
May 22	Ethics and the Right of Way Profession (103)	International Right of Way Association, (907) 266-1447	Anchorage, Alaska
May 23	Introduction to the Income Approach to Valuation (402)	International Right of Way Association, (907) 266-1447	Anchorage, Alaska
May 24	Valuation of Contaminated Properties (407)	International Right of Way Association, (907) 266-1447	Anchorage, Alaska
Jul 30 - Aug 2	Pacific Rim TransTech Conference	Washington State DOT, (206) 705-7802	Seattle Convention Trade Center, Seattle, Washington

Meetings Around Alaska

Society	Chapter	Meetings Days	Location
ASCE	Anchorage Fairbanks Juneau	Monthly, 3rd Tues., noon Monthly, 3rd Fri., noon Monthly, 1st Wed., noon*	Northern Lights Inn Captain Bartlett Inn Breakwater Inn * except June-August
ASPE	Fairbanks	Monthly, 1st Fri., noon	Captain Bartlett Inn
ASPLS	Anchorage Fairbanks Mat-Su Valley	Monthly, 3rd, Tues., noon Monthly, 4th Tues., noon Monthly, last Wed., noon	Executive Cafeteria Federal Building Ethel's Sunset Inn Windbreak Cafe; George Strother, 745-9810
ITE	Anchorage	Monthly, 4th Thurs., noon	Sourdough Mining Company
IRWA	Sourdough Ch. 49 Arctic Trails Ch. 71 Totem Ch. 71	Monthly, 3rd Thurs., noon** Monthly, 2nd Thurs., noon# Monthly, 1st Wed., noon	West Coast Internat'l Inn **except July & Dec. Captain Bartlett Inn #except December Mike's Place, Douglas
ICBO	Northern Chapter	Monthly, 1st Wed., noon	Zach's, Sophie Station
AWRA	Northern Region	Monthly, 3rd Wed., noon Brown Bag Lunch	Room 531 Duckering Bldg., University of Alaska Fairbanks, Larry Hinzman, 474-7331

To publicize an event in our calendar, contact us at (907) 451-5320.